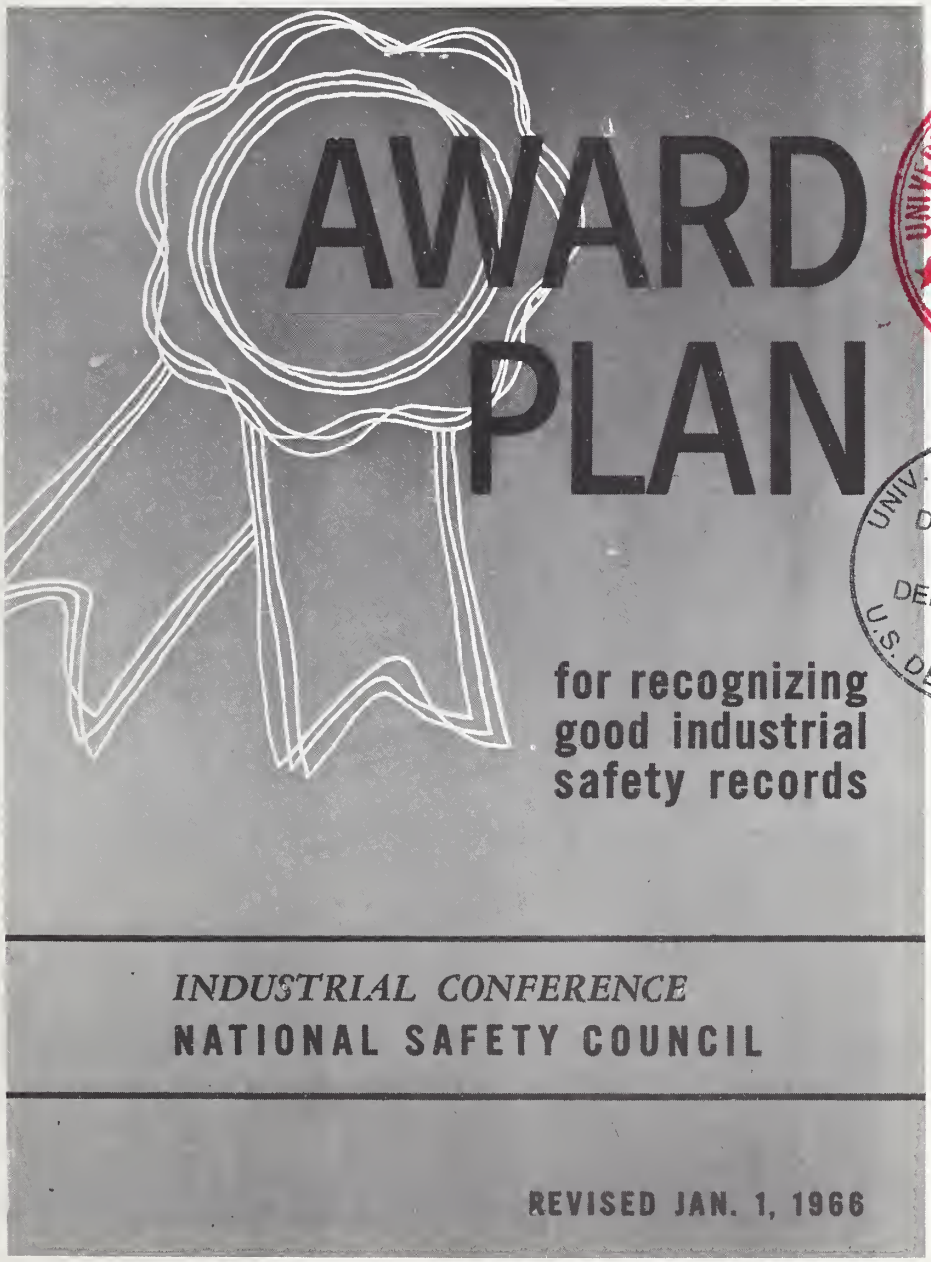
D 101.22/3: 385-84

AMC Pamphlet
AMCP 385-84

SAFETY DIGEST



UNIVERSITY OF FLORIDA LIBRARIES
APR 1969
DOCUMENTS DEPT.
UNIV. OF FLORIDA LIBS.
DOCUMENTS
DEPARTMENT
U.S. DEPOSITORY

JULY 1968

GENERAL BESSON, CG, AMC IS SHOWN RECEIVING THE NSC AWARD OF HONOR FROM GOVERNOR HOWARD N. PYLE, PRESIDENT OF THE NATIONAL SAFETY COUNCIL AT A CEREMONY IN BUILDING T-7, GRAVELLY POINT, WASHINGTON, D. C.

THIS IS THE FOURTH NSC AWARD OF HONOR WON BY AMC IN FIVE YEARS. DURING FY 1966 AMC WAS PRESENTED THE NSC AWARD OF MERIT FOR SAFETY.

HEADQUARTERS
UNITED STATES ARMY MATERIEL COMMAND
WASHINGTON, D.C. 20315

AMC Pamphlet 385-84 July 1968

The Safety Digest is an AMC Pamphlet prepared by the Safety Division, Headquarters, U. S. Army Materiel Command. Its purpose is to disseminate information which can materially influence and improve safety programs at all Command establishments.

Articles are included to supplement technical knowledge as well as practical knowledge gained through experience. They provide a basis for the further refinement of safety measures already incorporated in operating procedures and process layout. To achieve maximum effectiveness, the Safety Digest should be given widespread circulation at each AMC establishment.

Articles appearing in the Safety Digest are unclassified and are not copyrighted. They may be reproduced as desired in order to bring pertinent accident prevention information to the attention of all employees. The Army Materiel Command Safety Digest should be given a credit line when articles are extracted.

Unclassified material believed to be of interest or benefit to other establishments is welcome for publication in the Safety Digest. Please send articles for review to: U. S. Army Materiel Command Field Safety Agency, Charlestown, Indiana. If possible, include pictures, charts, drawings, and illustrations that clarify and heighten interest in your presentation.

(AMCAD-S)

*FOR THE COMMANDER:

CLARENCE J. LANG
Major General, USA
Chief of Staff

OFFICIAL:

WM. A. GREGORY
Colonel, GS
Chief, Administrative Office

Special Distribution

IN THIS ISSUE

FOREWORD I
IN THIS ISSUE II

ECOM ATTACKS SEAT BELT PROBLEM 1
ACCIDENT PREVENTION -- A PRODUCT OF BEHAVIOR 4
REDSTONE ARSENAL CIVILIAN PERSONNEL OFFICE DISPLAYS SAFETY SIGN 10
DEVELOP SAFETY ATTITUDE IN NEW WORKER 11
CREATIVE SAFETY THINKING 12
THINK ABOUT DRIVING 14
USE YOUR SAFETY DATA 16
SAFETY GLASSES HABIT SAVED SIGHT 18
"FALLS" INJURY PERCENTAGE STAYS HIGH 19
TEN COURTESY RULES FOR VACATION DRIVING 21
CURRENT EVENTS
- BUFFING WHEEL BAYONETS WORKER 22
- BY-PASSING SAFETY COSTS FINGER TIP 23
- ELEVATOR CATCHES RESTING WORKER 24
- LOOSE TANK CARS HEAD FOR SHOP 25

AN INCIDENT WITH STEAM AND FORMALDEHYDE 26
CHECK THOSE CHAIN HOOK PLATES 28
HYDRAULIC PRESS SAFETY MODIFICATION 29
POWER LAWN MOWERS 30
CHIEF OF STAFF, AMC PRESENTS NEW CUMBERLAND AD AWARD OF MERIT FOR SAFETY 31
PUEBLO ARMY DEPOT RECEIVES AMC AWARD OF MERIT 31
SEAT BELTS SERVE PURPOSE - ONCE, TWICE, THRICE 32
TACOM WINS NSC AWARD 32
BEWARE THOSE RAILROAD CROSSINGS! 33
ZAP! 35
EXPLOSIVES SAFETY
- TESTS IDENTIFY ILLUMINANT COMPOSITION HAZARD 36
- INSPECTOR FIRES ROUND ON ASSEMBLY LINE 40

DO YOU KNOW? 43
REFERENCE PUBLICATIONS 44
STOP BACKING INTO ACCIDENTS 45
FIELD SAFETY AGENCY RECEIVES AMC AWARD OF MERIT 46
WELL, DID YOU KNOW? 47
EXPERT DRIVERS' AWARDS 48
AMC WINS THE NATIONAL SAFETY COUNCIL FY 1967 AWARD OF HONOR FOR SAFETY..... (INSIDE FRONT COVER)
CREED FOR SAFETY ..... (INSIDE REAR COVER)

ECOM ATTACKS SEAT BELT PROBLEM

A relatively new aspect of an ancient problem was recently attacked by the US Army Electronics Command. The new aspect - seat belts. The ancient problem - getting individuals to habitually use protective devices and equipment.

After receiving several reports regarding the nation-wide decline in seat belt usage, Bernard M. Savaiko, ECOM Safety Director, called a meeting of Safety Officers to study the problem, and determine reasons for non-acceptance by personnel. Attendees at the meeting concluded that installation of seat belts was no longer a source of major concern. They felt the current problem stems from the numerous fallacies and doubts which have arisen regarding the value of these devices. The meeting led to the initiation of plans for a massive and intensive campaign to present the facts regarding the values of seat belts, and to dispel any doubts about the dangers of using them.

Specific plans were developed at subsequent meetings. "Seat Belts - Fact and Fiction" was adopted as the theme for the campaign. Poster artwork, radio announcements and newspaper copy were prepared. In early March, the plans were presented to and approved by Major General William B. Latta, Commanding General USAECOM. The campaign was announced through publication of his written proclamation which declared the week of 22-26 April as Seat Belt Education Week in USAECOM. Attendant publicity in the local paper spread the word. Additionally, the proclamation was transmitted to all USAECOM elements as an inclosure to a command directive urging full management support to the campaign, and encouraging participation by all personnel. Tenant activities at Fort Monmouth were invited to participate and took an aggressive role in the campaign. To keep a tight reign on progress during the preparation stage, a pert chart was developed. Each element of the campaign was listed on this chart along with target dates for design, printing, procurement and distribution. Responsibilities for following through on various projects were assigned to safety officers. Valuable assistance and advice was provided by photographers, illustrators and designers. Excellent cooperation was received from Information Office, Procurement and Publication organizations, which was most vital to the success of the program. Through these coordinated efforts, the campaign elements as outlined below, were completed with time to spare:

•1. A large poster was designed, printed, and distributed throughout the command. The poster contained a picture of a seat belt and the message "Seat Belt Education Week - 22-26 April 1968 - Facts and Fiction - A Time For Decision."

• 2. An eight page pamphlet entitled "Seat Belts, Facts and Fiction" was developed and produced. The pamphlet outlined factual information refuting the more common "rationalizations" for not using the belts. (15,000 copies of this pamphlet were distributed).

• 3. Five thousand attractive bumper stickers were procured and distributed. The stickers bore the ECOM emblem and the message "We Use Seat Belts."

• 4. Personal testimonials on the values of seat belts were solicited from people who had escaped serious injury in accidents by wearing seat belts. Sixteen testimonials were received, and nine of these were selected for publication in the Fort Monmouth Newspaper. Under the column heading of a 'roving reporter', the articles contained a short description of the accident, photograph of the individual, and when available, a photo of the vehicle involved in the accident.

• 5. Seat Belt films were obtained from the Army Film Library and the Bell Telephone System. The films were shown at seven locations throughout the command, and were mandatory viewing.

• 6. Seat belt messages were portrayed in AKshun Poster Units and Salescaster Message Devices throughout the week.

• 7. Articles on the decline in seat belt usage, crash injury data, and the advantages of "buckling up" children were published in the Fort Monmouth Newspaper.

• 8. Six 8 x 10 inch posters were designed, printed, and distributed to all organizational elements and distributed daily to Commissary and PX customers.

• 9. Seat belt slogans were printed in six consecutive issues of the Fort Monmouth Bulletin, and flyers were attached to two issues of this publication during the campaign week.

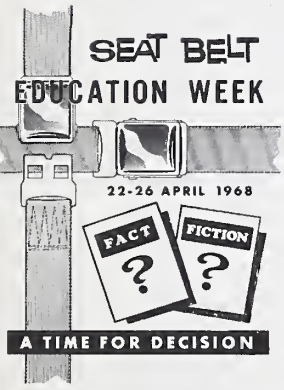
•10. Wanted posters were distributed containing a photo of the ECOM Safety Director behind bars. The posters offered a $25 reward to anyone who caught the Safety Director driving or riding without using his seat belt during the campaign week.

•11. "Make It A Habit - Prevent the Second Impact" was the USAECOM Safety Slogan for the month of April.

•12. "Safety Sue" billboards located at all gates portrayed the message "Seat Belts are a good thing to have around...you".

The effect of the program was measured by actual surveys taken at eight Fort Monmouth gate locations before, and after the campaign. Prior to the campaign, 15% of those surveyed were wearing seat belts. This percentage increased to 32% in the post campaign survey. The 113% increase in seat belt usage reveals that campaigns of this nature can achieve outstanding results. However, the post campaign survey showed that much additional effort must be directed toward the seat belt program. Accordingly, seat belt messages are being included in all traffic safety educational materials and future campaigns are being planned. Perhaps the most significant result of the campaign was the realization that seat belt education must be conducted on a continuing rather than a crash basis.

Gen. Latta, CG, ECOM, is shown signing proclamation which declared Seat Belt Education Week at USAECOM. Mr. Bernard Savaiko, Safety Director and Sgt. Major Peterson are to the left and right in photo.



WANTED
$25.00 REWARD
IF SUSPECT IS APPREHENDED NOT WEARING A SEAT BELT DURING SEAT BELT EDUCATION WEEK SUSPECT'S VEHICLE IDENTIFIED AS A BROWN & WHITE 1961 BUICK SUSPECT CAN BE CONSIDERED DANGEROUS IF CAUGHT.

Posters and Pamphlet Used in Campaign.

SAFETY SUE -- Col. George A. Kurkjian, commanding the Army Electronics Support Command, places a seat belt message in the hands of Safety Sue.

ACCIDENT PREVENTION-- A PRODUCT OF BEHAVIOR

War vs accidents

When war is mentioned we think of casualties. During seven years of conflict in Vietnam (1961-68), more than 20,000 American servicemen have been killed in combat. These losses are of concern to the President, the Congress, the public, the press, each of you now in uniform, and every man who faces possible military service in the future. The United States recognizes the need to concentrate all its forces of leadership, research, development and training to minimize combat casualties.

Casualties caused by accidents are not so clearly recognized as a critical national problem as are the casualties resulting from combat. Yet, during this same seven-year period, more than 25,000 servicemen died in various accidents, a greater number than our combat losses. Traffic accidents alone killed nearly 13,000 servicemen and more than 100,000 civilians of comparable ages during this period. It's easy to see that, for every combat death, more than five persons were killed on the nation's highways.

Minority groups who publicly demonstrate against war losses in Vietnam fail to recognize our nation's even greater accident toll. If fear of combat death is enough to cause some persons to seek asylum in other countries, then it follows that those who might flee from our nation's accident problems would soon make Canada and Sweden most populous.

Accident victims have filled more military hospital beds since World War II than has combat--and there have since been armed conflicts in Korea and now Vietnam.

Behavior--Key to accident prevention

Your key to survival on the battlefield is your behavior under fire; that is, your alertness, coolness, courage, response to orders, skill, knowledge, fitness and teamwork. Your key to survival <u>off</u> the battlefield depends on this same behavior.

In accident prevention, the question is not whether you <u>can</u> work or drive or play safely but whether you <u>will</u>. Investigations show that poor behavior contributes to accidents, whereas proper behavior can prevent them.

▶As an example: Anyone who has been trained to handle firearms knows that he should treat every weapon as if it were loaded.

Yet, each year, men are injured by "unloaded" weapons in the hands of their fellow soldiers; some were cleaning an "empty" weapon, while others aimed a supposedly unloaded weapon at their buddy and pulled the trigger.

Mistakes cause accidents

Mistakes happen, but mistakes cause accidents.

Let's look at the mistakes leading to the tragic killing of three soldiers in a blank firing exercise: One soldier mistakenly selected magazines loaded with ball ammunition. He did not double check to make sure his magazine was loaded with blanks.

No doubt, you've heard of other soldiers who also discovered ball ammunition which somehow got mixed with blank rounds. But note this one point: They discovered the mistake.

For every soldier, proper behavior with weapons means constant checking. Mistakes may sometimes occur, but, through safe behavior, you'll discover them in time to prevent accidents. So, if you're a safe soldier, you'll clear your weapon, then check to be sure a round is not still in the chamber. As a habit, you'll check your weapon in the field to see that sand, snow, a twig, or some other foreign object has not partially obstructed the bore. By double checking, you might discover an obstruction only once in a lifetime, but this one discovery could prevent an accident that would have cost your or your buddy's life. If you don't check, you might get by for a long time before experiencing that one last accident.

Familiarity breeds contempt

The old adage "familiarity breeds contempt" is especially true in accident prevention. Beginners in high risk operations--soldiers who work with parachutes, weapons, motor vehicles, planes, and explosives--usually show care and stick closely to rules. But, as they gain experience, some of these soldiers--perhaps you--take needless chances or short cuts, even play pranks. Confidence grows each time a man escapes from a near miss, so he might continue to take risks--until the accident occurs.

You've probably tried to understand the thinking of men who, time after time, show disregard for danger, like the old-time demolition experts who crimped dynamite fuses with their teeth! We'd certainly question the intelligence of any man who'd take such needless chances.

Would you knowingly fail to check your plane's fuel supply before take-off? Or smoke while handling gasoline or flammables? Or deliberately double the powder charge in a blank round and insert it into your buddy's clip, causing the breech to explode and blind him?

Telltale signs of unsafe behavior

Behavior which leads to accidents often shows itself by telltale signs. Think about a few:

■--Manner. Are you anxious, strained, grieved, preoccupied, tense or worried? If you're deeply troubled, you're a prime target for accidents, although later investigation might not uncover this background cause.

■--Attitude. Are you, or the man who works with you, indifferent toward work, a chronic complainer, frequently tardy, hostile toward superiors, malingering on sick call, or disdainful of rules? When attitudes sag, accidents shoot up. If you're engrossed in your own problems you won't contribute to your own safety or to the safety of others.

In a sudden cold snap last winter, 23 cases of frostbitten ears were reported at one Army post within a period of two or three hours. Men in the field on a training problem failed to use the earflaps on their headgear. Their ears turned white, but their buddies did not notice. This problem disappeared when buddies frequently checked each other for signs of frostbite and advised when earflaps should be used.

In short, if you're to survive, you need to show the same concern for your fellow soldier's safety that you'd like in return.

■--Emotions. Are you irritable, quarrelsome, restless, impulsive? Are you an excessive drinker? Most of us have seen the angry man in the comic strips who vents his bad temper by kicking a rock and, instead, hurts his foot. Accident reports tell of many men with chips on their shoulders who looked for trouble and found it. Quarrels cause injuries that are not accidental; they result from emotions that got out of control.

■--Ignorance. Tragic accidents have been caused by lack of training, guesswork, misunderstanding, over-confidence, and indifference. How many times have you heard someone say, after an injury or accident: "I didn't know"--"I never realized"--"I didn't think"--"Nobody told me"?

Unlike crime, accidents are not intentional. They're caused by faulty behavior based on ignorance. You might feel safe despite danger, because you don't understand the hazard. For example, did you know that loose black powder will explode? Some soldiers believe that black powder will just burn vigorously if ignited, so they use it in unauthorized experiments or pranks--and the consequences are tragic. Did you know that a car with locked brakes cannot be steered--and that normally the front end of a skidding vehicle, because it is heavier, brakes harder and makes the vehicle spin around? If you didn't know this, you could easily skid out of control, all the time believing that your brakes or steering gear had failed.

Accidents happen on and off duty, on and off post. Hq, USCONARC reports that 590 military persons were accidentally killed during fiscal year 1967; about 80 percent of these accidents occurred off duty. Out of every 10 soldiers who died from all accidental causes, seven died in POV (privately owned vehicle) accidents. The primary causes were excessive speed, sleepiness, and drinking. All these factors involved some action by the driver. Additionally, 46 soldiers drowned while swimming, boating or fishing.

What is accident prevention?

Accident prevention is a persistent and practical effort to eliminate needless risks to yourself, a buddy, or property.

Accident prevention is commonly found where military operations are conducted. You can readily name such routine safety devices as flak vests, helmets and helmet liners, foxholes, safety locks on rifles, arming pins on hand grenades, the "fail-safes" built into missiles and munitions, gas masks, parachutes, seat belts, and ear plugs.

Each of these devices contributes to your safety only if properly used. Your vehicle seat belt won't prevent an accident but it will increase your chances of survival. Your helmet won't prevent artillery fire but will help protect your head against shrapnel injury. If used, the safety lock on your weapon prevents accidental firing. The arming pin on a grenade resists accidental withdrawal, yet it yields readily to intentional arming; however, tragic accidents have occurred when soldiers straightened the pin so that it could be pulled out more easily--at the same time enabling the pin to be removed accidentally!

Is safety for sissies?

To some soldiers, safety implies cowardice. Yet, what good is bravery if you lie dead under an overturned jeep, or die while

sitting on an unfastened seat belt, or are killed while trying to open what you thought was a dud? Or if you must wear a hearing aid for the rest of your life because you failed to wear ear plugs when they were needed?

For your protection, safety is designed into your equipment whenever possible. Unfortunately, safety cannot be designed into you--or the man next to you. Your behavior, and his, determine whether safeguards will be used. Only your behavior--and his--can translate safety rules into either safe or unsafe action.

Safeguards

With safeguards and safe behavior, man can explore space and search the ocean depths--survive the intense cold of the South Pole--enjoy SCUBA diving, skiing, and sky diving. You can be safe in combat, handle hazardous equipment, survive hostile fire, play football, ride motorcycles, drive sport cars, or even walk safely along the road in darkness, if you combine a few simple safeguards with safe behavior.

Progress has been made

From the following statistics, you can see how the Army has progressed in preventing accidents.

In 1944, six of every 86 American soldiers worldwide were disabled because of accidents, compared to only one in every 86 last year.

In 1943, there was an average of 10,000 workdays between disabling injuries to Army civilians as compared to 40,000 workdays between injuries last year.

In 1946 an Army motor vehicle averaged one accident every 38,500 miles; last year the average distance between accidents was 130,000 miles.

In 1956, there was one Army aircraft accident for every 2,000 hours of flight. Last year an average of 6,300 hours was flown between each accident.

There are other signs of progress. Safer behavior is evident when you no longer have to say--or be told: "pick it up", "clean it up", "wear your helmet", "clear your weapon", "fasten your safety belt", "point your weapon down range", or "slow down".

Summary

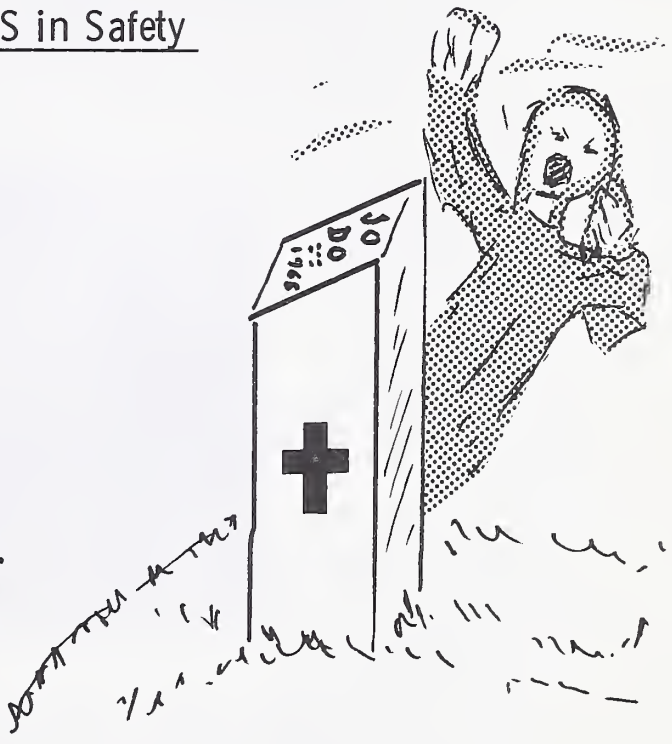
You've been provided with safer equipment and material than any soldier in history. But, in the final analysis, your personal safety depends on your own behavior. Safeguards are valueless unless they are used. Rules assure safety only when obeyed.

Each day you face numerous dangers in your "high risk" occupation. Your greatest danger is your unsafe behavior. This is one enemy you can easily find and eliminate. When you think it can never happen to you, that's the time to WATCH OUT.

When scheduling presentations, commanders are urged to keep in mind the importance of this subject to every member of the military establishment--officer, enlisted and civilian.

In addition, one or more of the following "Famous Last Words in Safety" may be used as fillers in post newspapers or daily bulletins.

FAMOUS LAST WORDS in Safety



Oh, it's not loaded.

I've always done it this way.

We don't have time to fix it.

I wonder what would happen if...?

Oh well, it's insured.

This'll give him a good scare.

I've never had an accident--yet.

Someone ought to clean up this mess.

So you won't dim--try my brights!

Oh, it's safe enough.

Let's stop for a drink.

What's the matter--you scared?

Golly, I'm bushed.

So you want to race?

Gasoline will clean it up.

Want to hear these tires squeal?

I'll bet you the other guy is chicken.

I wish I had time for a cup of coffee.

I ought to be leaving.

You might have to pump the brake pedal a bit.

Command Information Topic
CONARC

* * * *

REDSTONE ARSENAL CIVILIAN PERSONNEL OFFICE DISPLAYS SAFETY SIGN

REDSTONE ARSENAL
NOTICE TO THOSE SEEKING EMPLOYMENT
FOR THE PAST SEVERAL YEARS THIS INSTALLATION
HAS RECEIVED THE ARMY'S AWARD OF MERIT FOR ITS
OUTSTANDING SAFETY RECORD.
IF YOU ARE EMPLOYED HERE PLEASE HELP US MAINTAIN
OUR EXCELLENT SAFETY RECORD

Persons seeking employment at Redstone Arsenal, Alabama, are reminded of local emphasis placed on safety by this eye-catching sign. It was recently erected at the entrance to the parking lot in front of the Civilian Personnel Office. The sign portrays the genuine interest of the Civilian Personnel Officer and his staff in publicizing and supporting the safety record and program. Individuals admiring the sign are from left to right, Mr. Robert H. Seavers, Acting DASO Safety Director; Mr. John O. Harwell, Safety Officer; and Mr. Luther F. Adams, Deputy Civilian Personnel Officer.

DEVELOP SAFETY ATTITUDE IN NEW WORKER

John E. Probert
Superintendent, Safety and Protective Services
Olin Mathieson Chemical Corporation
Badger Army Ammunition Plant

A professional cook who undertakes preparation of an outstanding dinner first purchases the best meat and vegetables available. He knows that a fine product requires fine ingredients, properly used. This bit of ancient wisdom is applicable to your safety program. If you want an outstanding department and a safe plant, you must select good men, provide them with the fundamentals of safety and season them carefully with more safety on the job.

When personnel are selected, the familiar factors such as background, education, intelligence and ability are important. But these alone will not guarantee safety, regardless of how well the work environment may have been planned and engineered.

The one common denominator present in all successful safety programs is a positive ATTITUDE toward safety. It is essential that all personnel, from the lowest to the highest, have the right attitude. Without it you have a program of ingredients which have not been blended into a whole that will produce maximum effectiveness.

An individual with a good attitude is willing to accept and abide by rules and regulations. He is willing to cooperate and participate in the safety program. He is easy to teach and to trust.

The ideal time to develop the proper attitude toward safety is when the individual is first employed. He is then open-minded and willing to learn. He wants to be happy and secure in his new position. This is when industry should take full advantage of his receptivity and spend the time and effort to promote a desirable attitude toward safety procedures. Any delay can allow the individual to learn faulty ideas, habits and practices.

You will have a safer plant next month and next year if you start today with each new worker who joins your organization. The effort spent in starting him with the proper attitude toward safety will be profitable. Like a good investment his attitude will continue to pay off in safety as long as he remains with the organization.

CREATIVE SAFETY THINKING

C. D. Attaway, Chief Safety Engineer
Thiokol Chemical Corporation
Longhorn Army Ammunition Plant

Since the initiation of the Mission Safety-70 program, some installations seem to have reached a stalemate in their ability to effect further reduction in accidents in order to achieve the program goal. If the application of old and tried controls and countermeasures proves to be unsuccessful, there may be a belief by some that an "irreducible minimum" of accidents will have been reached.

The fact is that accidents are "irreducible" only when we fail to utilize our creative ability to solve problems. The first step toward achieving results is to recognize the fallacy of myths and "absolutes" long accepted as facts and to stop using these crutches as an excuse for failure.

From the dawn of time people have said "what goes up must come down". But man is putting objects in space and on planets that will never come down. Others in the past have said, "If God intended man to fly, He would have given man wings." Yet man flies today because he used his creative ability to overcome the myth that the flapping wing motion used by a bird in flight had to be duplicated. Instead, man found an entirely new aerodynamic concept involving a fixed or rigid wing.

A more creative approach to accident prevention technology can help in disproving the myth that "accidents are bound to happen". We may be spending too much time and effort in improving our accident reporting procedural and investigative techniques and too little time in studying zero-hazard design and error-free performance. Often we go about our tasks backwards. If a major league ball club wanted to teach its players to be better hitters, it would probably get someone like Ted Williams or Stan Musial to teach batting techniques. It certainly would not get a bush-league .100 hitter and tell its players to watch him hit and make certain they did not do what he did.

In effect this is the way some safety men go about accident prevention. They study accidents and the people involved instead of studying error-free performance of the individuals and machines rarely involved in accidents. As a result the myth of "accident prone" or "hazard repeater" individuals develop.

Another myth often accepted is that an accident is an unforeseen event or occurrence "over which we have no control". Many times this is said about accidents that were made possible by a failure of somebody to think creatively.

Some safety men feel that to get results is to get everyone into the safety program. This sounds good, but its magic can be seriously questioned. Actually, management from the top down through the supervisor is the backbone needed. Often there is entirely too much "hoopla" and "grandstand performance" in accident prevention. The electric light was not discovered at a rally, conference, seminar or convention. Neither was it developed by a committee.

The system that works is often not the ideal. The arc light had already been developed and was widely used on streets, but Edison did not accept it as the answer to the need for electrical illumination. He visualized the need for many small lights rather than a few large ones. He created a new kind of generator with low internal resistance, the parallel circuit, the filament and the bulb. He lived by the motto, "There must be a better way -- find it."

Quite often there is a tendency to think that the safety manuals, standards and safe practice guides have the answer, when they may have only an answer -- and perhaps not the best one at that. Anyone who engages in creative thinking must go beyond the limitations of what ought to be there, what must be there, or what has always been there.

● There may be a simple solution to a simple safety problem but usually not to a complex one. There must be a total solution if the total problem is to be solved. When a point of diminishing returns or the irreducible minimum is accepted, the total problem is not solved. Then is the time for creative thinking in the form of new approaches, different methods, other viewpoints, remote causes and effects. Even trivia and ideas on a discarded as impractical or wild thought might be modified into the ultimate solution. Dissatisfaction with the old and a willingness to examine and try the new are required for a creative approach to our safety problems.

THINK ABOUT DRIVING

Paul Moran, Jr., Safety Officer
Sunflower Army Ammunition Plant

If the blond secretary in the nearby office should happen down the corridor laden with heavy folders, you might rush to help her. If your buddy Joe out on the lines is about to make a heavy lift, you would go out of your way to assist, knowing he would do the same for you.

But something happens to you in the parking lot after work. If the same lissome blond pulls out in front of you in her car, you see red. Now she's that "dizzy blond" in a hot car, no longer friendly or even human. Your reaction is much the same if Joe cuts you off in his rattling pick-up truck. Like the blond, Joe has donned an offensive, impersonal machine.

As you brake to miss either Joe or the blond, you promise yourself that no one else will get away with "that routine" today. Without realizing it, you have become as offensive a person as the vehicle drivers who compete with you. No change for the better in your personality is likely until you reach home, if you do.

Of course, impatience alone will not kill you on the highway. It takes a lot of factors to do you in. Rain, another driver's bad attitude, a friendly drink along the way, speed, an unexpected obstacle in the road, a mistake by another driver and many other circumstances can set you up for an accident. When any one of scores of possibilities fall into place, an accident may occur unless you react correctly.

In the United States we buried 53,000 traffic victims in 1966. Another 1,900,000 were disabled. Many of these dead and injured were better drivers than you are. Some were younger, some older, some drove safely until the final moment. Thousands were in the right, yet they were hospitalized or buried. They were unable to cope with situations they encountered.

▶How can you expect to drive home safely?

Better highways are one answer, but you need safety now. Safer cars may help, if and when they build them and you can afford one. Driver education and training should produce improvement, but most of it remains to be done. What is the answer for you this afternoon on the highway?

▪▪▪▪Mr. Moran wrote this article while he was a member of the FY 1968 Safety Career Management Intern Training class at the U. S. Army Materiel Command Field Safety Agency.

The odds are excellent that you can get home safely by using the safety knowledge you already possess. Most of it might be classed as plain common sense.

(1) Use all your skills for safe driving all the time you are driving.

(2) Think about driving safely instead of arriving at a certain time.

(3) Drive defensively. Anticipate tricky intersections, changing traffic lights, slippery bridges and other known obstacles as you approach them.

(4) Analyze the route to find a better way home, even if the alternate route costs you a little time.

(5) Buckle your seat belt.

(6) Practice courtesy while you drive. It will not harm you in the least to yield to the other driver. It will leave you calm, unruffled and practically always uninjured.

(7) Allow yourself a safety margin at all times. When you tailgate, drive too fast for conditions, or put yourself at the mercy of the other drivers you invite disaster.

(8) Be alert. Watch the road, other traffic and highway entrances. Keep your eyes moving.

(9) Leave your thoughts of the job, your problems and your workday irritations at the office or shop. Keep your mind on your driving.

(10) Keep your car in good running order. Commuting traffic is as tough as you are likely to encounter.

■ Not one of these suggestions is new. They are among many you know. Those dead and injured drivers also knew them. Their error was their failure to make use of their knowledge. You are lucky because you still have time to think and to save yourself, starting today.

USE YOUR SAFETY DATA

You may be wasting a stream of riches that is flowing across your desk. It bears that everyday name of accident statistics. It is fed by two sources, one outside your plant and one within. Both feed in rich mixtures of data that can help you do a better job of preventing accidents.

At Army Materiel Command subordinate commands, installations and activities a new AMC Statistical Summary of Accidents becomes available each month. Here are some of the services it provides for you:

▶ 1. The data shown for your installation is a public report on how successful you, your supervisors, your personnel and your Commander are in preventing accidents and injuries. Your successes and your failures are exposed to the public.

▶ 2. The Statistical Summary shows how your installation stands in comparison with other installations. No matter how unique your mission may seem to you, there are probably several other installations with similar missions. You may help yourself by measuring your performance against their safety experience.

▶ 3. The publication shows various objectives which you have been challenged to surpass. These are the current AMC accident, injury and per capita targets. The data published in each issue enables you to determine whether you are excelling or failing to achieve these goals.

▶ 4. The figures in the Statistical Summary show changing trends in major areas. If such thing as the number of AMC injuries, fatalities, fires, explosions or total damage costs begin to accelerate, it is time to take stock. Your workers may have been making some of the same mistakes that have caused disaster elsewhere, and not have resulted in a severe accident.

▶ 5. The publication contains current tables of the leading causes of injuries you are trying to prevent. You are fumbling in the dark when you try to prepare a safety program without such information on current happenings.

▶ 6. These are the statistics of your professional safety field, waiting your use. It would be helpful for you to study this information with the same interest that you would expect bankers, investors and farmers, to give to their news media releases.

Your locally available statistics should be even more valuable, because every bit of information is applicable to your program. The data will come in a raw, unsorted form that requires an effort by you to identify, evaluate, interpret, organize and use.

● Your local accident data has two great merits that are missing from the information you can get from the Statistical Summary.

■ 1. The first of these is completeness of the local data. Comparatively few accidents - perhaps two or three in a hundred - are severe enough to be recordable in the Statistical Summary. The local area of interest and accident data encompasses all accidents, all injuries and all property damage no matter how minor these may be. Most of your work involves preventing these minor accidents.

■ 2. The second special merit of your local statistics is the fact that they tell you exactly what is happening to your own people. They show your own special trends and individual problem areas. They permit you and your supervisors to take immediate action. If wasp stings require frequent first aid, you know control measures must be taken before some worker has a truly serious reaction. A minor chemical burn may be a signal that protective clothing and additional training are needed.

● Several things are especially important if you are to get full benefit from your local statistics.

■ 1. You must get the data promptly. If a new machine allows Joe to smash or bruise his hand, you need to know about it today. If the information is not passed along, an uncorrected exposure to a hazard may permit additional and more serious injuries. The information sources are available, but supervisors and safety personnel must make certain they are utilized.

■ 2. Information must be as complete and as honest as possible. Pretending an accident did not happen or is not reportable can be as dangerous as Russian roulette. The next time fate is tempted, disaster may result.

■ 3. You need to get some of the information at the scene. Others can bring only part of it to your desk. You must go yourself to see, to learn, to understand and to be prepared to think and act.

■ 4. The information must be organized into a usable form. If it is not organized, little use can be made of it. You are in a position to determine what parts are useful and important. The proper identification, evaluation, arrangement and interpretation are an important part of your job.

Once you have all the available data organized, you are in a position to analyze and use it. If you make a wise determination of what is valuable and invest it in a well thought out accident prevention effort, you benefit your workers by making them safer. You have the added satisfaction of showing and proving that you are a working professional.

SAFETY GLASSES HABIT SAVED SIGHT

Mr. James E. Conlon, a Rock Island Arsenal employee, has shared his enthusiasm about safety glasses with his fellow workers. A picture of his damaged glasses and a statement signed by him have been used to make a poster that is used throughout the Arsenal.

Mr. Conlon became a safety glasses enthusiast as a result of a work experience. He was trying to remove the pin that held the sight cover to the receiver of a .50 caliber machine gun. Two of the special drift pins used for this task bent while he was using them. He then took a new sight pin like the one he was trying to remove and used it as a punch. He held the new pin in place with a pair of pliers and struck it with a hammer. The blow caused the pin to fly clear of the pliers and to strike the lens of Mr. Conlon's safety glasses. The photo shows the result.

"I consider myself very fortunate that the Arsenal insists on the wearing of safety glasses," Mr. Conlon wrote for use on the poster. "I know they saved the sight of my right eye and possibly my life."

"FALLS" INJURY PERCENTAGE STAYS HIGH

Safety and supervisory personnel in AMC are failing to make full use of one management principle that leads toward success in any field. Stated simply, it consists of recognizing the biggest problem and either solving it or taking action that reduces it to more easily manageable size.

The biggest safety problem in AMC, measured in terms of disabling injuries, is the common fall. While other more sensational accidents usually get attention, people continue to fall and to receive disabling injuries. "Falls" Is the Leading AMC Injury Cause in the July 1965 Safety Digest stated that falls caused over one-fifth of the AMC disabling injuries during one six-month period studied. Falls are now consistently causing one-fourth of the injuries recorded by AMC. The percentage shows no sign of decreasing.

The following table shows the number of disabling injuries AMC personnel have received from falls. Parenthesized figures are the percentage of the total AMC disabling injuries.

	Falls Diff. Level	Falls Same Level	Total Falls	Percentage of AMC Injuries
FY 1968 (8 Mos)	61 (14.5%)	47 (11.2%)	108	25.7
FY 1967	110 (14.5%)	81 (10.6%)	191	25.1
FY 1966	89 (14.3%)	67 (10.7%)	156	25.0
FY 1965	96 (11.9%)	106 (13.2%)	202	25.1
FY 1964	114 (13.1%)	90 (10.4%)	204	24.5
FY 1963	97 (11.1%)	96 (11.1%)	194	22.2

AMC has not been able to complete a year without some person being killed in a fall.

	Fatalities in Falls
FY 1968 (8 mos)	1 (different level)
FY 1967	1 (different level)
FY 1966	2 (different level)
FY 1965	1 (different level)
FY 1964	4 (different level)
FY 1963	1 (same level)

These statistics reflect only fatalities and disabilities that prevented workers from being on the job on a workday subsequent to receipt of the injury. Many people fell but escaped injury or were able to limp back to work. In these less serious instances there are costs in discomfort, pain and lowered efficiency.

Unless more effective action is taken, the injuries caused by falls will continue at the present level or will creep higher. The only effective action is close and constant attention to fall prevention by all safety personnel, all supervisors and all workers. Every person has to make an individual effort, because only he can protect himself and others from falling. Work is required to reduce falls and resultant injuries.

The agencies and conditions associated with falls continue to be the ones familiar to everybody. These include loose objects on floors, irregular surfaces, wet or slippery surfaces, openings in the surfaces, ladders, inattention, haste, poor housekeeping, stairs, exposure without protective equipment at high places, poor lighting and others easy to recognize when seen.

● Nearly all of the AMC injuries caused by falls can be prevented by such simple practices as the following:

▶ 1. Good housekeeping.

▶ 2. Elimination of tripping hazards, such as wires and other obstacles on floors.

▶ 3. Wiping up spilled liquids, from coffee to oil.

▶ 4. Removal of ice and snow from walks and parking areas.

▶ 5. Alertness of personnel.

▶ 6. Walking instead of running.

▶ 7. Use of handrails on stairs and guardrails on elevated surfaces.

▶ 8. Protection from floor openings.

▶ 9. Adequate lighting.

▶ 10. Use of adequately maintained ladders, properly placed when in use.

▶ 11. Caution in descending from high places. This should rule out jumping down from elevations and moving vehicles.

▶ 12. Performing or requesting prompt action to eliminate a fall-causing condition whenever one is found.

Besides preventing falls, actions such as these improve your working conditions. If falls continue, it will be obvious that a needed accident prevention job is being left undone through lack of work at it.

* * * *

TEN COURTESY RULES FOR VACATION DRIVING

✔ 1. Make allowances for strangers who may be unfamiliar with local traffic rules. Remember that you become a stranger yourself every time you venture off your familiar routes.

✔ 2. Lower high beam lights when you meet or overtake a car.

✔ 3. Do not tailgate. When you do, you become dependent on the driving ability of the driver ahead, who may be incompetent to be behind a wheel.

✔ 4. Do not cut in or weave in and out of the line of traffic.

✔ 5. Use directional signals or hand signals when moving from lane to lane or turning.

✔ 6. If the other motorist fails to yield, do not insist on your right of way. It is safer to let him have his way. He will probably be out of your life forever in a few seconds.

✔ 7. When another car moves to pass, do not make it more difficult by speeding up. Would you walk faster if someone strode pass you on the sidewalk?

✔ 8. When a passing driver seeks a place in your lane, slow down and let him in.

✔ 9. Drive as though the other fellow has a right to be there, too.

✔10. Courtesy is contagious. Give it a try, and observe how many hazards it removes from your driving.

BUFFING WHEEL BAYONETS WORKER

The Army employee, an electroplater, finished his work assignment before the end of his shift and looked about him for work that needed to be done. He saw some dress bayonets that required finishing to make them acceptable. Without consulting his supervisor he undertook the task.

The bayonets were required to be highly polished and scratch-free. The worker selected three that showed small scratches and turned to a cloth buffing wheel to polish these away. The wheel he used was two inches thick, 18 inches in diameter and contained unstitched cloth. It turned downward toward the operator at a speed of 1600 rpm.

While he was polishing a blade, the electroplater pressed it against the wheel at an incorrect angle. This caused the bayonet to catch in the side of the wheel and to be jerked from his hands. It was pulled around the guard enclosure until it struck a deflector plate at the top front of the wheel. This permitted the bayonet to be thrown from the wheel.

The thrown bayonet struck the left thigh of the worker and inflicted a wound that caused him three days absence from work.

The installation started a thorough training program for all employees who would be required to perform the polishing operation. Only those who had been trained were then permitted to perform the work.

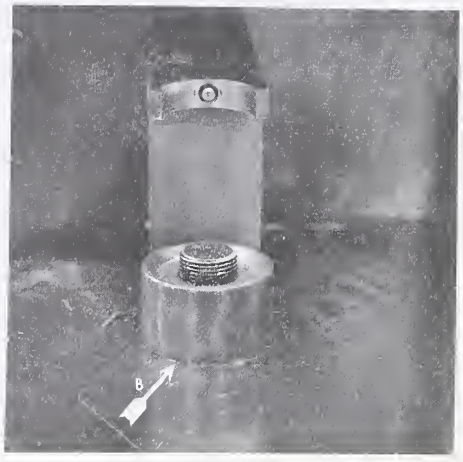
A study was also undertaken to determine whether the work could be performed satisfactorily with a different type of wheel.

BY-PASSING SAFETY COSTS FINGER TIP

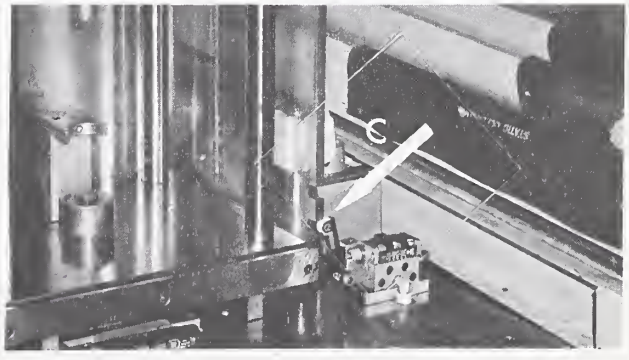
A millwright was performing maintenance work on a hydrostatic tail fin test machine at an AMC installation. As he proceeded with his work he took two courses of action that by-passed safety. He failed to turn off the machine, and he controlled the hydroram by pressing the safety switch with his thumb.

The hydroram is shown in the up and down positions in photos A and B. The safety switch, to which the arrow points in photo C, was designed to prevent the operation of the hydroram when the machine shield was open. By pressing the switch with his right thumb, the millwright was able to keep the hydroram open. Using a rag in his left hand he cleaned oil from the ram area.

While he was working with his left hand, his right thumb slipped off the switch. The powered machine promptly caused the hydroram to function. It moved down, caught and amputated the tip of his left index finger.



The millwright was reinstructed in safe methods of performing maintenance work. Emphasis was given to turning off power before a machine was cleaned.



ELEVATOR CATCHES RESTING WORKER

Scrap explosives were moved from the first floor of a building to the second floor by means of an elevator. The threshold was about 30 inches above the floor level. Entrance to the shaft was barred by a gate that could be raised and lowered to within five inches of the doorsill.

An explosives operator loaded several containers of scrap explosives on the platform, lowered the gate into place and set the elevator into motion. He then waited for the elevator to return after the material was unloaded by a worker on the floor above. During his short wait, he seated himself on an empty fiber container and rested his right arm on the 30-inch high sill. His elbow and lower arm were under the elevator guard. (See staged photo 1).

A short time later the elevator descended without attracting the operator's attention. His elbow was caught between the threshold and the bottom of the elevator. The crushing force caused arm and elbow injuries that kept him away from work for two weeks.

1.

2.

● The following actions were taken to eliminate the opportunity for similar injuries:

▶ 1. Alterations were made to eliminate the five-inch opening beneath the elevator gate. (See staged photo 2).

▶ 2. Wire mesh was placed over the remainder of the gate to cover the remaining openings.

▶ 3. The injured operator was retrained and emphasis was placed on the proper attitude toward use of existing protective devices.

LOOSE TANK CARS HEAD FOR SHOP

A "cut" of nine acid cars had been left in the oleum area of an Army plant. Some time later four workers in the area began to move and spot these tank cars by use of a winch-type car mover. An area mechanic operated the winch and an acid pumper operator climbed aboard the fourth car in the "cut" to act as brakeman.

When the cars approached the desired area, the worker riding the car applied the hand brake. This caused six of the nine cars to come to a stop. The coupling between the acting brakeman's car and the one ahead of him was not securely closed. The coupling became disengaged and three cars rolled free.

The spotting site was on a grade. The loose cars began to pick up speed. When the area mechanic saw they were out of control, he tried unsuccessfully to overtake them. The tank cars gained momentum and moved on down the tracks toward a locomotive shop three miles away.

The wild tank cars covered the three miles to the locomotive shop before news was received that they were loose. The doors of the shop were closed when the cars arrived. They crashed through the first door, struck a parked switch engine and pushed it out through the closed door in the opposite wall.

Damage to the two large overhead locomotive shop doors was estimated at $2,800.

● The following practices were initiated to prevent similar accidents:

● 1. Car couplings would be inspected to see that proper connections were made.

● 2. The man who acted as brakeman would be on the downgrade car of the "cut".

● 3. The number of cars moved at one time would be limited.

● 4. A study would be made of the advantage or disadvantages of the plant railroad derail device.

AN INCIDENT WITH STEAM AND FORMALDEHYDE

Charles A. Glick
Industrial Health and Safety Office
Fort Detrick

When a ventilated biological cabinet or hood containing infectious material is to be repaired, shut down, or a change in agent is to be made, the cabinet is decontaminated with a disinfectant. The disinfectant of choice is usually steam-formaldehyde.

The standard solution for disinfecting a cabinet is 3 parts methanol to 5 parts formalin solution. This is introduced by means of a steam ejector, air nozzle or other suitable means. The formaldehyde-methanol solution is vaporized into the cabinet in a quantity of 1 ml per cubic foot of air being exhausted over a 30-minute period, plus 1 ml for each cubic foot of space within the cabinet. If a cabinet contains 50 cubic feet of space and the air exhaust is 20 cfm, then 650 ml of formaldehyde solution, 1 (20X30) + 1 (50), must be vaporized during the 30-minute treatment period.

In the incident reported here several contributing factors resulted in an explosion and fire-ball, but fortunately no injury or damage. A technician prepared a one-gallon quantity of formalin by mixing 1 part methanol to 2 parts formalin. Prior to vaporizing this mixture into a cabinet (about 200 cubic feet and about 10-20 cfm air exhaust), he presteamed the interior of the cabinet for 10-15 minutes with flowing steam from a 40 psi steam line. The formalin-methanol mixture was vaporized through a 40 psi steam ejector in 8-10 minutes instead of the customary 30 minutes.

Just prior to the end of the vaporization of the methanol-formalin mixture an explosion occurred. The overpressure created blew off several of the attached arm-length rubber gloves. An operator who was separated from the direct explosion by a second cabinet system observed an orange fire-ball between the two cabinets. Other personnel on the first floor observed a blue cloud or flame travel down a stairwell and past various rooms in a corridor. The pressure wave blew open two doors at the end of the corridor.

The first reaction of the operator who witnessed the explosion was to close the main propane gas valve in the attic section of the building. This area is on the same level as the room with the cabinets.

On inspection and checking with an explosion meter, personnel from the Fire Department and the Industrial Health and Safety Office found a propane gas valve, a branch off the main line, was leaking. This valve was located near the doorway to the room housing the cabinet.

Conclusions:

Formaldehyde has an explosive range of 7.0 to 73.0 per cent by volume in air and a flash point of 130°F. Methanol has essentially the same explosive range and a flash point of 60°F. (open cup). Quantities normally used result in a concentration of approximately one per cent by volume of each gas. The solution used here was introduced in more than four times the quantity called for in standing operating procedures and it was introduced in one-third the time (less than 10 minutes), instead of the 30 minutes called for in the standing operating procedure. This further increased the concentration. An explosive concentration was certainly present within the cabinet system. A spark resulting from static electricity and generated by the steam was probably the ignition source for the formaldehyde-methanol gas mixture. This flame flashed outside the cabinet and set off a second flash of propane gas that had leaked from a faulty valve into a hallway and down a stairwell.

Recommendations:

1. Preheat time for increasing relative humidity should be reduced to that time necessary to show moisture and some warmth throughout the cabinet.

2. Personnel using formaldehyde to disinfect cabinets or other areas should use that amount of formalin/methanol recommended and vaporized at a rate to complete the vaporization in 30 minutes, not 10 minutes.

3. Propane gas lines should be checked periodically to locate and correct any gas leaks. Accepted valves for gas use should be installed. Maintenance personnel and contractors should be instructed on installation of the correct valve.

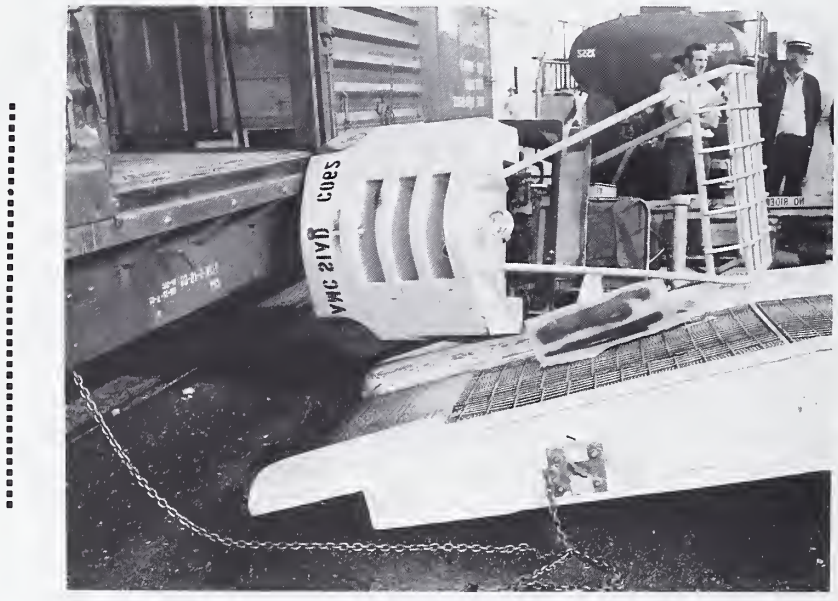
4. Installed gas lines into a closed cabinet should be discouraged. The use of alcohol burners, portable propane burners or butane laboratory burner is recommended.

CHECK THOSE CHAIN HOOK PLATES

Use was being made of a mobile ramp to permit movement of a fork lift truck into and out of a railroad car. The ramp was attached to the car by means of a chain on the right side and a nylon web strap on the left side. No difficulty was experienced until the car was half loaded. Then an accident occurred when the operator of the fork lift deposited his load and started to back his machine out of the car.

The ramp shifted away from the car until no part of it rested on the floor. The ramp and the fork lift then fell to the ground. The fork lift landed on its left side, on the left edge of the ramp, with its top resting on the ground.

The operator received a compound fracture of his right foot and was away from work for 30 days.



During the investigation of the accident, it was discovered that the right chain hook plate on the ramp had been installed backwards. (See Photo). The incorrect installation had apparently been made by the manufacturer.

The ramp was promptly declared to be unsafe, and necessary action was taken to correct the installation of the plate hook. The web steps on all portable ramps were replaced with chains. Personnel were given instructions on the proper procedures for installing ramps and making use of ramps with railroad cars and motor vehicles.

HYDRAULIC PRESS SAFETY MODIFICATION

Donald G. Schley and Kenneth H. Hindman
Industrial Health and Safety Office
Fort Detrick

An employee was using a 25-ton hydraulic press to remove a bearing from a truck axle. During the performance of this routine operation the press operator sustained a painful head injury.

Investigation showed that the hydraulic ram adjustment wheel on the right side of the press had four spokes that projected out approximately 15 inches from the center. This wheel is used to position the hydraulic ram. The wheel then is locked out with a lever and hydraulic force is applied by means of a 24-inch hydraulic pump handle inserted into a sleeve just below the hydraulic ram adjustment.

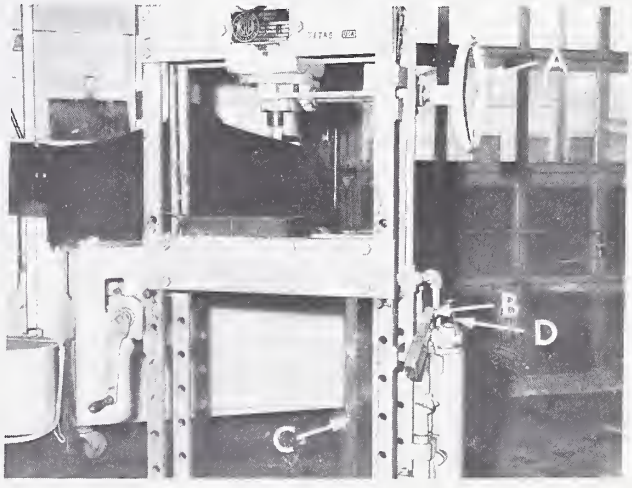
In this case, when the bearing broke free, the pressure change caused the hydraulic ram adjustment wheel to move in an arc that caused one of the spokes to strike the operator on the head. This resulted in a head wound that required eight stitches.

● To prevent another similar accident two modifications were made:

✔1. The hydraulic ram adjustment spokes were replaced with a 12-inch diameter wheel.

✔2. A hook was installed on the press platform so that the hydraulic pump handle could be kept with the machine. This encourages its use instead of manual operation of the sleeve. Previously the handle had been kept leaning against the wall about five feet away from the press.

The 25-ton hydraulic press is shown after it was modified. The hydraulic ram adjustment wheel with projecting spokes was replaced with a safer wheel (A). The 24-inch hydraulic pump handle (C) hangs on a hook. This makes it convenient to slip on the pump sleeve (B) and reduces the likelihood of manual operation. A lockout lever is indicated by (D).



POWER LAWN MOWERS

Robert R. Cavanaugh
Safety Officer, St. Louis Army Ammunition Plant

It's that time of the year again. But just like the automobile, each year the number of injuries and deaths associated with lawn mowers do increase alarmingly.

Considering the number of accidents and deaths that occur to those who have "never had an accident before", it's important for you To Be Reminded Just Once More. We might save a few toes, fingers, an eye or maybe save a life.

A power mower is no longer a luxury to most homeowners. It is a necessity. Depending on the operator, it can be efficient, labor saving, or a deadly machine that maims and kills. Ask the man who had two whole feet this time last year but has a "club" in the place of one good foot now; or the guy who started with two good hands last year but lost three fingers to a whirling blade last August. If this isn't enough to convince you, see the man who lost his wife to a power mower blade that sailed 50 feet and through a plate glass window before striking and killing her. Try not to listen to the parents of a two-year-old girl who was struck in the heart by a nail thrown by a rotary mower. These people may be able to convince you that using the following rules for the safe operation of the power mower is the least you should do.

- ✓ 1. Do not attempt to make adjustments or refuel while engine is running.
- ✓ 2. Be sure blade does not extend below mower housing.
- ✓ 3. Check mower for worn and dangerous parts before starting.
- ✓ 4. Do not lift or tip mower while engine is running.
- ✓ 5. Thoroughly check area to be mowed (stones, nails, wire or sticks). Remove all foreign objects.
- ✓ 6. Do not allow other persons in the mowing area.
- ✓ 7. Do not allow children to operate the mower.
- ✓ 8. Do not remove guards or attempt to unclog mower while it is operating.
- ✓ 9. Do not pull the mower; always push it away from you.
- ✓ 10. Wear good heavy shoes (safety) and eye protection while mowing.

✔11. Do not leave mower unattended while engine is running.

✔12. When your mowing job is over for the day, disconnect the spark plug wire and store away from the children's play area.

..... * * * * .....

CHIEF OF STAFF, AMC PRESENTS NEW CUMBERLAND AD AWARD OF MERIT FOR SAFETY

MG C. J. Lang, Chief of Staff, AMC, is shown presenting the AMC FY 1967 Award of Merit for Safety to Col. John W. Irving, CO, New Cumberland Army Depot. Norman Smith, Safety Director is shown on the left.

PUEBLO ARMY DEPOT RECEIVES AMC AWARD OF MERIT

Pueblo Army Depot has received the AMC Award of Merit for Safety for its FY 1967 achievement in preventing accidents. Colonel Donald H. Greeley, Pueblo Army Depot Commander (left), is shown above accepting the Award from Major General Clarence J. Lang, Chief of Staff, AMC. Colonel Elbridge L. Snapp, Assistant to the Deputy Commanding General, AMC, looks on.

SEAT BELTS SERVE PURPOSE - ONCE, TWICE, THRICE

The effectiveness of seat belt use was demonstrated three times in quick succession a few months ago on U. S. Route 40. PFC George C. Christianson and another soldier were returning to Aberdeen Proving Ground. Soon after Christianson's new Opel crossed the Delaware state line into Maryland, it came upon an ice-slick spot and went into a spin. When it reached the end of the ice, it rolled over, landed on its wheels, crossed into the northbound lane and came to a stop. Christianson and his companion were saved from injuries by their fastened seat belts.

While the soldiers talked to State Police, two more cars struck the icy patch. In each case the automobile went into a skid, the driver failed to regain control and the vehicle overturned. None of the four occupants of these cars was injured because they all had "buckled up for safety".

In the picture below PFC Christianson is shown telling APG Safety Officer James Leath about his accident. PFC Christianson and the people he met at the U. S. Route 40 slick spot are enthusiastic supporters of seat belt usage.

TACOM WINS NSC AWARD

The U. S. Army Tank-Automotive Command has been notified that they have qualified for a NSC Award of Honor for operating 8,661,034 man-hours without a disabling injury from 19 August 1967 to 15 January 1968.

BEWARE THOSE RAILROAD CROSSINGS!

It is ironic that in this era of superhighways and overpasses, grade crossing collisions are taking a larger toll of lives. In 1966, the latest full year for which information is available, 1,740 fatalities occurred at grade crossings. This was an increase of about 12 per cent over 1965, according to the National Safety Council.

Why should grade crossing fatalities increase at a time when more safety is being built into automobiles and highways?

The reasons are not at all mysterious.

1. Many automobile drivers pay little attention to grade crossing hazards. They become involved in collisions that could be avoided with ease by an attentive person.

2. There are fewer, though longer trains on many tracks, and the drivers apparently do not look for them. When a train does appear, the driver discovers it too late. The locomotive hits his vehicle, or in two out of five accidents, he smashes his car against the train.

3. Inattentive drivers disregard the efforts the railroad provides for their safety. They fail to hear locomotive whistles and ringing bells. They do not see flashing red lights or the watchmen who try to flag them to a stop.

4. Vehicle operators drive too fast to stop before they smash into the train or are caught in front of it. Each year the railroads replace thousands of crossing gates that have been smashed by automobiles.

5. Impatient drivers take the chance of trying to get across the track ahead of a train they know is coming.

● The driver and his vehicle are always the losers in a grade crossing collision with a train. You can win by avoiding any contest on the railroad right of way. Practice of these simple rules will keep you free of a collision with a train.

1. Keep your attention on your driving. When you do this you will watch for trains as well as the other highway hazards.

2. Always expect to see a train on the track. Look and listen whenever you approach a railroad. When a train is there, it is usually easy for the alert person to see it.

3. Keep your speed under control. If you cannot make a needed emergency stop before you are on the track, you are driving too fast. Your vehicle is out of control!

4. Stop when the railroad flasher signal starts or the gate starts down. Expect a train on the crossing within 20 seconds.

5. If you are already on the tracks when the flasher or bell starts or the gate begins to descend, move on until you clear the crossing.

6. Never stop your vehicle on a railroad track. Stalled traffic may create a stopping situation. If you cannot move all the way across, stop before you reach the tracks.

7. After a train has passed, look both ways before you drive across the tracks. Wait until you can see clearly that no approaching train has been hidden by the one that caused you to stop.

8. If you should stall on a track, dismount from your vehicle and get yourself off the track. After you have made certain no train is approaching, take appropriate action to push the vehicle off the track. Watch for trains while you are doing this.

9. Do not drive around a lowered crossing gate. The railroad has let it down to protect you.

10. Do not race the train. It moves much faster than it appears and it outweighs you by thousands of tons.

For your common safety you should also cooperate with other drivers who are alert to grade crossing hazards. Do not follow them too closely. Beware of vehicles that are required by law to stop at all railroad crossings. These include school buses, other passenger buses and trucks that carry flammables and explosives. A collision with any of these is big trouble.

ZAP!

The March 1968 edition of the Safety Digest carried an article about the electrical shock hazard associated with a fluorescent desk lamp. Another type of fluorescent lamp has been found to present a similar shock potential. An AMC employee received a serious shock when this lamp was touched. Investigation disclosed an internal short circuit which resulted in the exterior of the lamp becoming "live".

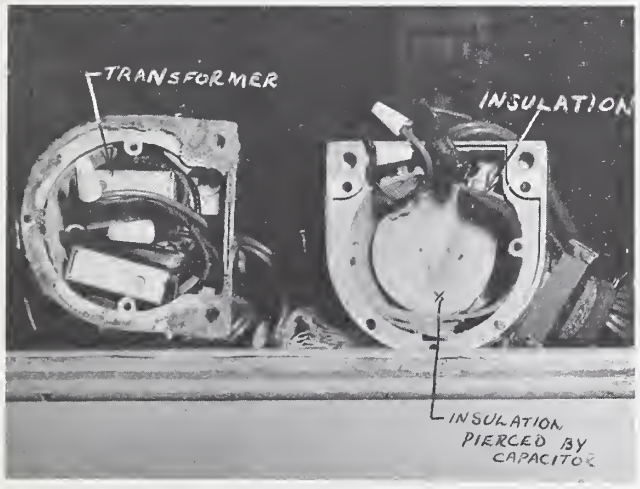
The lamp shorted out because the soldered connections on a capacitor had penetrated the cardboard insulation intended to isolate the capacitor from the transformers. A transformer, in turn, contacted the base of the lamp because the cardboard insulation between the two had slipped. An inspection of other lamps of the same model at the installation revealed similar conditions to exist.

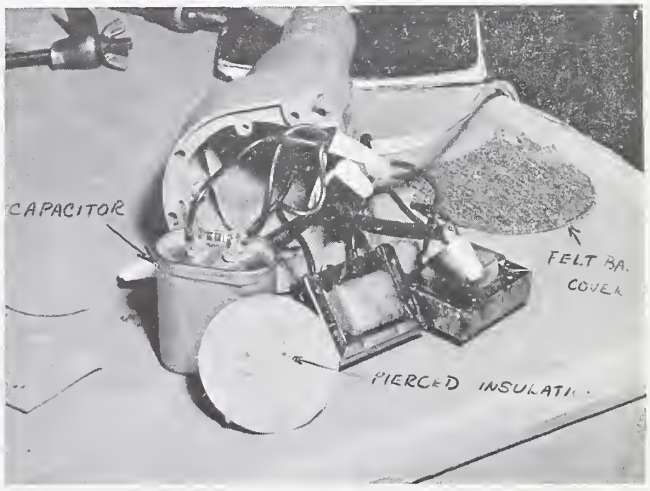
Corrective actions taken included improving the insulation between the capacitor and the transformers and between the transformers and the base, a third-wire ground was also provided.

Identification of the lamp is as follows:

Light, desk, fluorescent, swing arm type
FSN 6230-682-3422
Specification: W-L-312A

This and the previously reported incident point up the merit of periodically examining all electrical equipment for potentially hazardous conditions.





TESTS IDENTIFY ILLUMINANT COMPOSITION HAZARD

Knowledge of the fire hazard and explosion characteristics of an illuminant composition is required for its safe and large scale use in a manufacturing operation. At the Longhorn Army Ammunition Plant the 105mm, 155mm, 81mm and 4.2-inch illuminant compositions used are a mixture of magnesium powder, sodium nitrate, laminac binder and less than one per cent total of lupersol, pluronic and cobalt napthenate. The Thiokol Chemical Corporation, contractor-operator of the plant, conducted tests of "as mixed" samples of the composition to determine the hazards offered by the material.

Three samples were obtained from a routinely processed production mix of each of the four compositions. Each composition was sampled after mixing for five minutes, seven and one-half minutes and 10 minutes. These times were selected in order to obtain samples of the mixes at one-third mixing time intervals following the addition of all ingredients. Three charges were prepared from each sample, making possible nine tests per composition.

No attempt was made to pack or tamp the material when loading the sample tubes. All lumps were broken up, the material was poured in, and the tube was shaken by hand until the material was level with the top.

TEST NO. 1

This test was conducted in keeping with instructions for the card gap test procedure detailed in paragraph 22, Section III, Department of the Army Technical Bulletin 700-2, 31 July 1962, "Explosives Hazard Classification Procedure". [1]

No detonations occurred at "zero cards" on any of the charges tested. On the basis of these results and the explosive classification criteria outlined in paragraph 25b, TB 700-2 it was concluded that the materials tested were a Class 2 hazard for storage purposes.

TEST NO. 2

A burning test was then conducted to observe the reaction obtained when 105mm illuminant composition was ignited. The material used was about 60 pounds of unconsolidated composition, mixed on the day of the test and suitable for pressing.

The test was conducted at the plant's explosive burning ground. Two workers, attired in protective clothing that consisted of aluminized coat, hood and gloves, took a container of the composition to the designated test site. They emptied three to four pounds of the material into a garbage container lid, making a layer of composition about an inch thick. They then carried the remaining composition to a preselected five-gallon bucket about 50 feet away and filled it three-fourths full. The weight of the material in the bucket was about 20 pounds.

The ignition system consisted of a two-minute (three-foot) section of Ensign-Bickford safety fuse with a sack containing one-half ounce of solid propellant taped to one end and a match head in the other. The fuse and solid propellant were assembled about 200 feet from the sites. The two men setting up the test then took the fuse assemblies to the test sites and each set a fuse. The sacks of solid propellant were placed just under the surface of the material, with the top of the sack above the composition. The fuses were lighted simultaneously and the men retired to the control point.

Two minutes after the fuse was lit, the 20 pounds of illuminant composition in the bucket burned at an even rate. The flame from the burning material appeared to be about 10 feet in diameter and 30 feet high.

The bucket was burned but it remained intact. It contained residue from the burning. During the burning, some of the material was ejected from the can and caught the grass on fire. This area covered by the material was approximately 20 to 30 feet in diameter.

The lid of material failed to ignite when the smokeless powder ignited. After the required interval of time had elapsed, the men, clad in protective clothing, approached the lid. The fuse and propellant had functioned properly. The material surrounding the sack was scorched.

After an inspection of the sites by the observers, the next portion of the test was conducted. This consisted of placing two five-gallon cans approximately 50 feet from the previous test sites. Each can was filled approximately three-fourths full in the same manner as the previous can. The fuse assemblies were placed one-half way down in the composition. The fuses were ignited simultaneously, and the men retired to the control point.

After a two-minute interval, the two cans of material burned as had the previous can. An inspection of the area revealed that the material had performed exactly as the previous experiment. The can in which the fuse was buried one-half way down in the composition melted during the sub-surface burning.

Upon completion of this test it was concluded that the illuminant composition would not deflagrate when ignited, even though the igniting medium was buried halfway down in the composition. This bore out the earlier conclusion that the composition was a class 2 hazard.

TEST NO. 3

A third test was made to determine the reaction of a 150-pound batch or mass of the illuminant composition used for 105mm when it was subjected to a submerged ignition in a simulated "Muller" type mixer.

The simulated mixer was set up in the explosives burning grounds at the required distance, for quantity of material involved, from the remote firing bunker. Two M-2 squibs were attached to a bag of "sharp-shooter" powder for a booster. The ignition or firing devices were placed in the bottom of the mixer, and the illuminant composition was placed over them to a depth of approximately seven inches. The material was ignited from the bottom, to simulate an ignition that might be caused by scraper blades making friction or metal-to-metal contact with the bottom of the mixer or a foreign object being caught between moving parts and the mixer bottom. Bikini gauges were erected on opposite sides of the mixer at distances of 25 and 50 feet to measure over-pressure, if it should be generated.

After connecting the squib leads to the firing circuit, the test personnel retired to the control bunker and fired the composition by remote control. The material burned for approximately 20 seconds with a brilliant white fire that extended about eight feet high. There was no explosion and no overpressure evidence on the Bikini gauges.

It was concluded that this illuminant composition is also a class 2 hazard.

The tests established 105mm, 155mm, 81mm and 4.2-inch illuminant compositions in the "as mixed" condition to be a class 2 hazard but not a mass-detonating hazard.[2] The conclusions reached upon the basis of the three staged tests have been borne out by experience gained at various times later in manufacturing process fires. In these fires various quantities of the illuminant propellant burned without exploding.

[1] The 31 July 1962 issue of Army Technical Bulletin 700-2 has been superseded by an issue dated 19 May 1967.

[2] The Hazard Classification section of AMC Safety Information Letter No. 2-68, 30 January 1968, contained the following statement: "Class 2 quantity-distance requirements are applicable in the manufacture of the illuminating composition used in 105mm (M314), 155mm (M485), 81mm (M301) and 4.2-inch (M325) ammunition. Since the composition is not shipped as a bulk material, no other hazard classifications are required."

AMC AWARD OF MERIT PRESENTED TO JOINT MILITARY PACKAGING TRAINING CENTER

The AMC Award of Merit for FY 1967 has been won by the Joint Military Packaging Training Center. The award was presented by Brigadier General Edward A. Bailey, Director of the Personnel and Training Directorate, AMC. Shown receiving the award are Mr. C. Y. Best, Director of the Center, and Mr. Norman Pickett, safety representative. The Center claims it has operated for 17 years without a disabling injury caused by an accident.

INSPECTOR FIRES ROUND ON ASSEMBLY LINE

An incident at an AMC installation shows how an imperfectly designed facility and a deviation from an operating procedure by one person may combine to cause a major accident.

The accident occurred during one of the steps in the assembly of 76mm rounds. The worker whose act caused the occurrence was a quality control inspector, standing in the position shown in staged photo 1.

Photos 1 and 2 show how a metal chute was used to move the rounds through a plywood laminated steel shield that separated two workbays. When the worker in the left bay finished a crimping operation the round was placed in the chute. It then slid or was pushed down the chute through the opening in the wall into the chamber gaging bay. If another round was already in the chamber gage end of the chute, it rested on a control device. Through interconnected switches this activated a cylinder to block the passage of the shell down the chute from the crimping bay. The control switch and the cylinder are visible in photo 2, taken from the lower end of the chute.

The quality control inspector removed a round from the lower or chamber gage end of the chute. He then took it to the crimping area to show the crimp operators a smeared stencil. His act of lifting the round from the chute released the control switch, permitted the cylinder to retract and left the way clear for another round to move down the chute.

A production supervisor who entered the area at this time saw the quality control inspector take the shell into the crimp area and return with it. He recognized the act to be in violation of an accepted safe practice and he hurried forward to stop the inspector. He was a second or two too late, and the man with the round disappeared behind the shield.

Back in the position shown in photo 1, the inspector started to replace the round in the chute. It was too late for this to be done safely. A worker in the crimping bay had started another round down the chute and its base had moved beyond the retracted cylinder.

The pointed windshield of the inspector's round and the round in the chute smashed together. (Photo 3, staged with inert rounds, shows the approximate position at this moment. The retracted protective cylinder can be seen outside the chute in the upper right center.) The windshield scraped along the base of the cartridge case until it struck the primer. (See photo 4).

☆ U.S. GOVERNMENT PRINTING OFFICE : 1968 342-751 (1)

The primer functioned, and this ignited the propellant. The cartridge case burst. Fragments of metal and unburned powder were blown about the area.

The most severely injured person was the inspector. He received compound fractures, lacerations and severe wounds that involved his left leg, hip, shoulder, forearm and hand. Two men who were working in the crimping bay were disabled for weeks by a variety of fractures, contusions and lacerations involving chest walls, ribs, face, arm and hand. Four nearby workers, including the production supervisor who had been rushing forward to stop the unsafe act, required treatment for minor injuries. Three other workers in the bay were not injured.

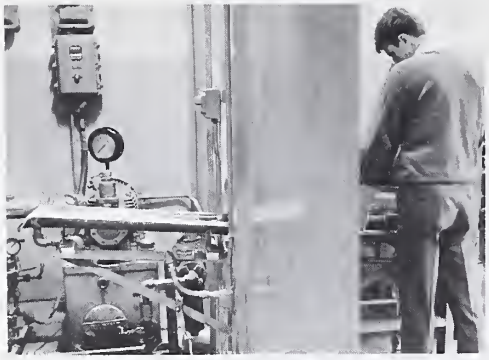
Photo 5 shows the opening in the barricade wall after the explosion. The twisted piece of metal at the left is a section of the cartridge case lodged in the wall.

Photo 6 shows the appearance of the crimping bay after the detonation. The projectile at the lower left was crimped in the cartridge case involved. The detonation occurred in the area where the chute led through the wall at the right. The second projectile on the floor came from the charged cartridge resting on the crimp table. The floor is littered with unburned powder from the detonated round.

Photo 7 shows the butt of the exploded cartridge case and unburned powder. The explosion involved about .7 pound of M-30 propellant powder, an M-58 primer and an M-13 tracer. The unburned powder recovered weighed 4.9 pounds.

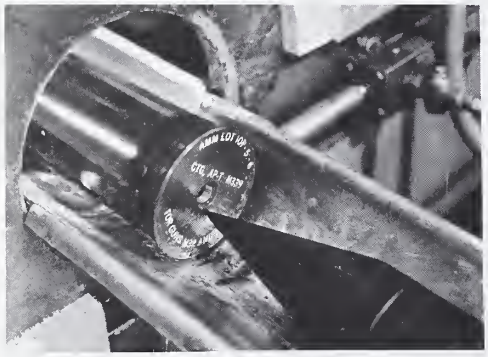
After the accident an engineering study was started to determine whether the transfer chute could be redesigned. Its objective was to prevent exposure of the base of one cartridge case to the projectile end of the shell ahead of it in the production line.

All operators and inspectors were reinstructed on correct shell handling procedures. A perforated sheet metal guard was attached to the transfer chute with a sign warning employees not to return removed shells.



1

2

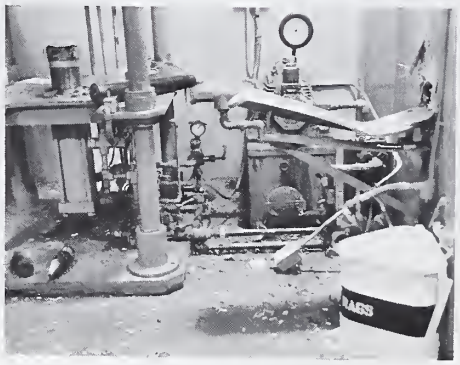


3

4

5

6



7

Here are 10 questions that will test your knowledge of safety requirements that you will need under different circumstances. The answers to all of them may be found in AMCR 385-224. How many can you answer without referring to the regulation? The correct answers and references appear on pages 47 and 48.

1. At what distance from class 7 explosives is a railway car considered to be safe from blast effects?

   Answer and reference:

2. How long may cars of explosives and ammunition be permitted to remain in a railway classification yard?

   Answer and reference:

3. Is it necessary to build a dike around a quantity of drums used for storing gasoline?

   Answer and reference:

4. How often should band saw wheels be tested?

   Answer and reference:

5. What hazardous conditions are likely to arise if nitric acid is permitted to come into contact with other materials?

   Answer and reference:

6. What is the purpose of air terminals in a lightning protection system?

   Answer and reference:

7. What types of vehicles are preferred for hauling ammunition and explosives?

   Answer and reference:

8. Is black powder, which came into use many years ago, safer to handle than most of the propellants and explosives now used?

   Answer and reference:

9. What fire-fighting measures should be expected to be performed by personnel who evacuate an explosives building upon discovery of a fire?

   Answer and reference:

10. What are the fire extinguisher requirements for a truck used to transport a shipment of explosives?

    Answer and reference:

* * * *

REFERENCE PUBLICATIONS

AR 40-21, 1 March 1968
Medical Service, Medical Aspects of Army Aircraft Accident Investigation.

AR 75-15, 16 Feb 68
Explosives, Responsibilities and Procedures for Explosives Ordnance Disposal.

AR 95-18, 5 March 1968
Aviation, Grounding of Army Aircraft and Safety of Flight Messages.

AR 385-14, 11 December 1967
Safety, Accident Reporting Procedures, Army-Shipped Non-Nuclear Explosives and Dangerous Articles Transported By Commercial Carriers.

AR 385-80, 25 April 1968
Safety, Nuclear Reactor Health and Safety.

DA Cir 55-45, 28 March 1968
Transportation and Travel, Transportation Movements Guide.

DA Cir 350-61, 8 March 1968
Training, Commanders and Staff Officers Aviation Safety Orientation Course.

DA Cir 350-62, 8 March 1968
Training, Army Aviation Safety Course.

DA Cir 40-48, 25 April 1968
Medical Service, Prevention of Heat Injury

STOP BACKING INTO ACCIDENTS

Vehicle backing accidents rarely make sensational news. They are slow motion affairs that produce bent metal but few bloody victims. Still they are important because they are costly; they can cause injuries and they may cause a substantial rise in your vehicle frequency rate. Those $50 damage (recordable) to motor vehicle accidents can undermine hard won gains achieved in the rest of your safety program.

The typical backing mishap is an entirely unnecessary accident. For confirmation of this you need only recall any in which you have been involved or instances you have seen.

A backing accident should be the easiest one for the individual driver to prevent. It results from a deliberate action he takes. He has plenty of time to take whatever preventive action is necessary, and he is usually in full control of his vehicle. Action in accordance with three basic rules will protect him and his vehicle in most instances.

■ 1. Avoid backing whenever practicable. Forethought and habit can do much to reduce the need to back your vehicle. Here are a few pointers:

● a. Know or learn in advance where you must stop. Then stop in a place where you can move out by driving forward.

● b. Stop before you enter pedestrian walkways.

● c. Choose parking spaces where you can pull in and pull out without backing your vehicle.

● d. Avoid parking spaces where you must back out into moving traffic.

■ 2. Make certain the way is clear before you back.

● a. Dismount from your cab or vehicle and survey the area into which you intend to back.

● b. Find all the obstacles that you might back into.

● c. Make certain there is clearance on both sides and above. Overhead pipes, building eaves and wires are often low enough to strike.

● d. Back to your left whenever possible. The right is likely to be your "blind" side.

● e. Use a guide. He can see where you cannot, and he may also be able to prevent other vehicles from striking you.

● f. Sound your horn.

■ 3. Back cautiously.

● a. Take your time.

● b. Look to the rear frequently as you back.

● c. Watch all your mirrors.

● d. Watch your front end swing as you begin to turn.

☆These rules are simple. They are worth the effort required to put into practice whenever you drive.

FIELD SAFETY AGENCY RECEIVES AMC AWARD OF MERIT

The AMC Field Safety Agency received the Army Materiel Command Award of Merit for superior achievement in accident prevention in FY 1967. The award was presented by Dr. Francis S. McGlade (right), Deputy Safety Director, Department of the Army. It was accepted by Ray L. Myers (left), Director of the Agency, and Robert B. Henry, Safety Director.

■ The Field Safety Agency's FY 1967 record, which was free of disabling injuries and Army motor vehicle accidents, also won a National Safety Council Award of Merit.

Here are the answers to the questions on pages 43 and 44. All questions were based on information contained in AMCR 385-224. A reference to the pertinent paragraph follows each answer: -

1. A railway car is considered to be safe from blast effects of class 7 explosives at 60 percent of the inhabited building distance. This lesser distance is based on the smaller height and area of the railway car exposed to blast; the greater resistance of cars to blast as compared with buildings; and the fact that while a building is stationary and subject to risk constantly, the presence of a train is only temporary. Reference: Paragraph 1703.

2. Cars of explosives and ammunition in a railway classification yard should be switched for transfer as soon as possible. They should not remain in the yard for more than 24 hours. Reference: Paragraph 1713.

3. Gasoline stored in aboveground tanks or in drums should be diked in accordance with paragraph 58, NBFU Pamphlet No. 30, "Containers for Storing and Handling Flammable Liquids". Reference: Paragraph 1721c.

4. Band saw wheels should be tested at least once a week to detect and replace wheels with cracks or loose spokes. Reference: Paragraph 923.

5. Nitric acid forms explosive compounds with most organic materials. With nearly all oxidizable material, it forms flammable compounds, some of which are subject to spontaneous ignition. The oxides of nitrogen, commonly called "nitrous fumes", evolved in a nitric acid fire are exceedingly toxic. Reference: Paragraph 1308.

6. The purpose of the air terminals in a lightning protection system is to intercept the electrical discharge at a safe distance above vulnerable and flammable parts of structures.
Reference: Paragraph 803b.

7. Cargo type trucks and truck-tractor drawn semitrailer vans are the preferred types of equipment for transporting ammunition and explosives.
Reference: Paragraph 2205.

8. No. Black powder is very sensitive to friction, heat and impact. These properties make it one of the most dangerous explosives to handle.
Reference: Paragraph 1423a.

9. After activation of deluge systems, if available, employees should clearly understand that their first duty is to report any fire to the fire department immediately after detection. No employee shall reenter an explosives building to fight a fire except as directed by proper authority.
Reference: Paragraph 1218b.

10. A truck used to transport a shipment of explosives shall be equipped with at least two standard class B, C portable fire extinguishers. As a minimum these shall have a classification of 1-B,C.
Reference: Paragraph 2205d.

EXPERT DRIVERS' AWARDS

Sacramento Army Depot recently presented NSC safe driver awards to its employees. Bottom row left in the photo are Stephen C. Lopez, one-year; John A. Bleizeffer, 20 years; Jack Weber, 21 years; and David W. Wooley, 19 years of safe driving. Top row, left to right are Sacramento AD officials Tony H. Kelley; Harry M. Ewing, Depot Safety Director; Walter Serpa; Russell Bohart and William Brown.

CREED FOR SAFETY

We believe . . .

• that no man lives or works entirely alone. He is involved with all men, touched by their accomplishments, marked by their failures. If he fails the man beside him, he fails himself and will share the burden of that loss. The true horror of an accident is the realization that a man has failed himself—and more—that his fellows have failed him.

• that accidents are conceived in improper attitudes, and born in moments of action without thought. They will cease to be **only** when the proper attitude is strong enough to precede the act—when the right attitude creates the awareness that controls the act.

• that the prevention of accidents is an objective which crosses all levels of rank, organization and procedure.

• that freedom from harm is not a privilege but a goal to be achieved and perpetuated day by day.

• that the elimination of injury and pain through accidents is a moral obligation upon which the final measure of our performance directly depends.

American Society of Safety Engineers

"Approach" - The Naval Aviation Safety Review - June 1968

UNIVERSITY OF FLORIDA
3 1262 09304 9293

FLARE

UNITED STATES ARMY MATERIEL COMMAND

WASHINGTON, D.C. 20315